

User's Guide

Instructions for Installation and Operation

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900 MHz Video Transmitter
Model VT900-3A



900 MHz Video Receiver
Model VR900-3

Applied Wireless, Inc.

900 MHz Video Transmitter

Models VT900-3A

900 MHz Video Receiver

Model VR900-3

Product Descriptions

Model VT900-3A from Applied Wireless, Inc. is a high quality transmitter designed to broadcast standard NTSC or PAL composite video signals to the Applied Wireless model VR900-3 receiver. The VT900-3 conforms to FCC Part 15 requirements for unlicensed use, and will transmit over distances up to 750 feet.* The range may be increased substantially through the use of a directional antenna (such as a flat panel or Yagi) at the receiver.

* Unobstructed, straight line-of-sight range, when used with the standard antennas included with the transmitter and receiver.

The VT900-3 transmitter and the VR900-3 receiver provide three user-selectable channels of operation within the 902 – 928 MHz band to enable simultaneous operation of up to two transmitters in a common area. Excellent frequency stability is assured through the use of crystal references. The products incorporate precise FM modulation and sophisticated filters to provide stable, interference-free high quality color or B/W video plus audio reception.

The transmitter and receiver are housed in small yet rugged aluminum extrusion enclosures. AC power converters (12VDC) are supplied, along with RCA phono-type video and audio cables.

The VT900-3 transmitter and the VR900-3 receiver are well-suited for many diverse applications, including distribution of video content throughout a building, commercial and industrial surveillance, monitoring, security, access control, etc.

Installation Instructions

Before Beginning the Installation

Plan your installation carefully. The physical location and orientation of the transmitter itself (and its antenna) relative to the receiver antenna will have a significant influence on reception quality at the receiver, particularly at longest ranges. For best results, **the transmitter and its standard antenna, as well as the receiver antenna, should be positioned vertically (pointing either up or down)**. If necessary, use double-sided foam tape or hook & loop fasteners (not supplied) to secure the transmitter to a vertical surface. Also, keep in mind that the RF signal from the transmitter will travel through most non-metallic building materials (wood, stucco, brick, etc.), however *maximum stated reception range is based on unobstructed line of sight conditions*.

Selecting the Channel of Operation

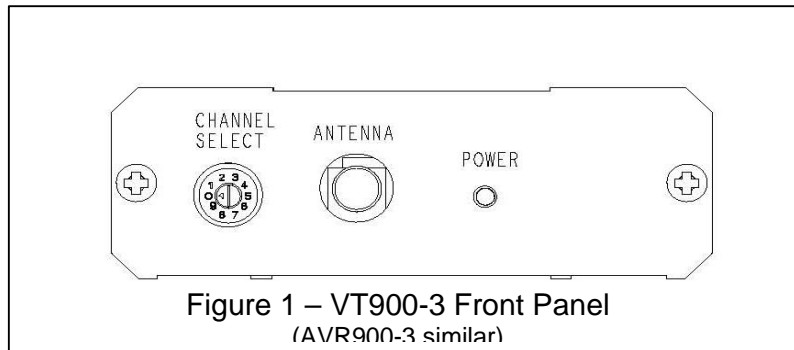
Referring to Figure 1, use a small flat-blade screwdriver to select the channel (frequency) on which the transmitter will operate, by aligning the triangle-shaped pointer (not the screwdriver slot) to the number of the desired channel. Set the receiver to the matching channel. Channels are as follows:

Channel 1: 907 MHz

Channel 2: 915 MHz

Channel 3: 923 MHz

Any other setting of the channel selector (0, 4, 5, 6, 7, 8, 9) defaults to Channel 1.

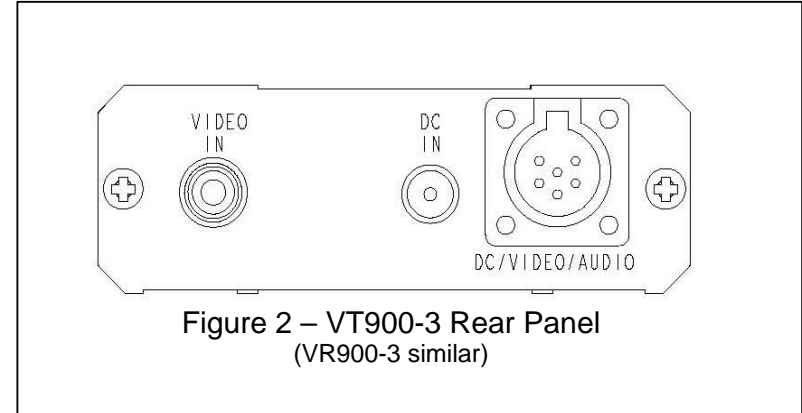


If two VT900-3 transmitters are to be used simultaneously in a common area (so as to broadcast two different video sources), set one unit to Channel 1 and the other unit to Channel 3. It is not advisable to attempt to use three units simultaneously as co-channel interference may occur.

Connecting Video to the VT900-3

Following the guidelines below, connect composite video source (output from a camera, for example) to the corresponding composite video input jacks on the transmitter's rear panel (refer to Figure 2). Appropriate shielded cables are supplied with the transmitter for making these connections.

The VT900-3's video input presents a terminated 75-ohm load to the output of the video source device. Accordingly, no other device(s) besides the VT900-3 should be connected to the video source. If any additional device(s) must be driven by the source device, a video distribution amplifier (not supplied) must be used.



Connecting the Receiver's Video Output

Using the shielded cables provided, connect the receiver's video output to the appropriate inputs on the device that is to display, record, or process the received video signal.

Connecting Power to the Transmitter and Receiver

The VT900-3 and the VR900-3 each require an external power source of between 7.5 and 18 volts DC. A plug-in power converter (12VDC) is supplied with each unit.

CAUTION: Do not apply power to the VT900-3 transmitter unless the supplied antenna is attached to its mating jack on the front panel. Powering the transmitter without an antenna may result in failure of the transmitter's RF output device and void the warranty.

Insert the power converter's 2.1mm plug into the DC IN jack on the unit's rear panel (refer to Figure 2). Plug each converter into a live 120VAC outlet. The unit's red Power indicator LED (on the front panel, refer to Figure 1) should illuminate.

Using the Combination Power/Video Connector(s)

As an alternative to using standard audio and video interconnect cables, the VT900-3 transmitter and the VR900-3 receiver each provide a combination Power/Video connector on the unit's rear panel. The pinout of these connectors is the same for both transmitter and receiver. The pinout of the combination Power/Video/Audio jack, and its mating plug (not supplied), is illustrated in Figure 3 and Table 1. Contact Applied Wireless, Inc. if you wish to purchase an optional Combination Power/Video cable.

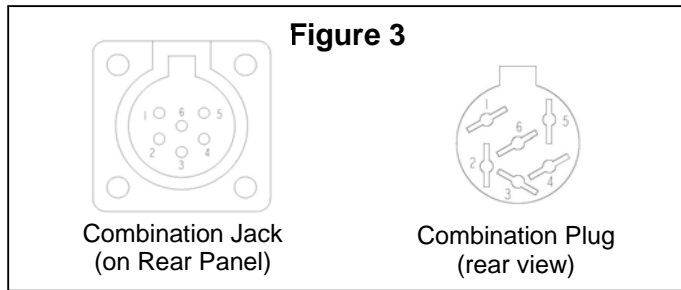


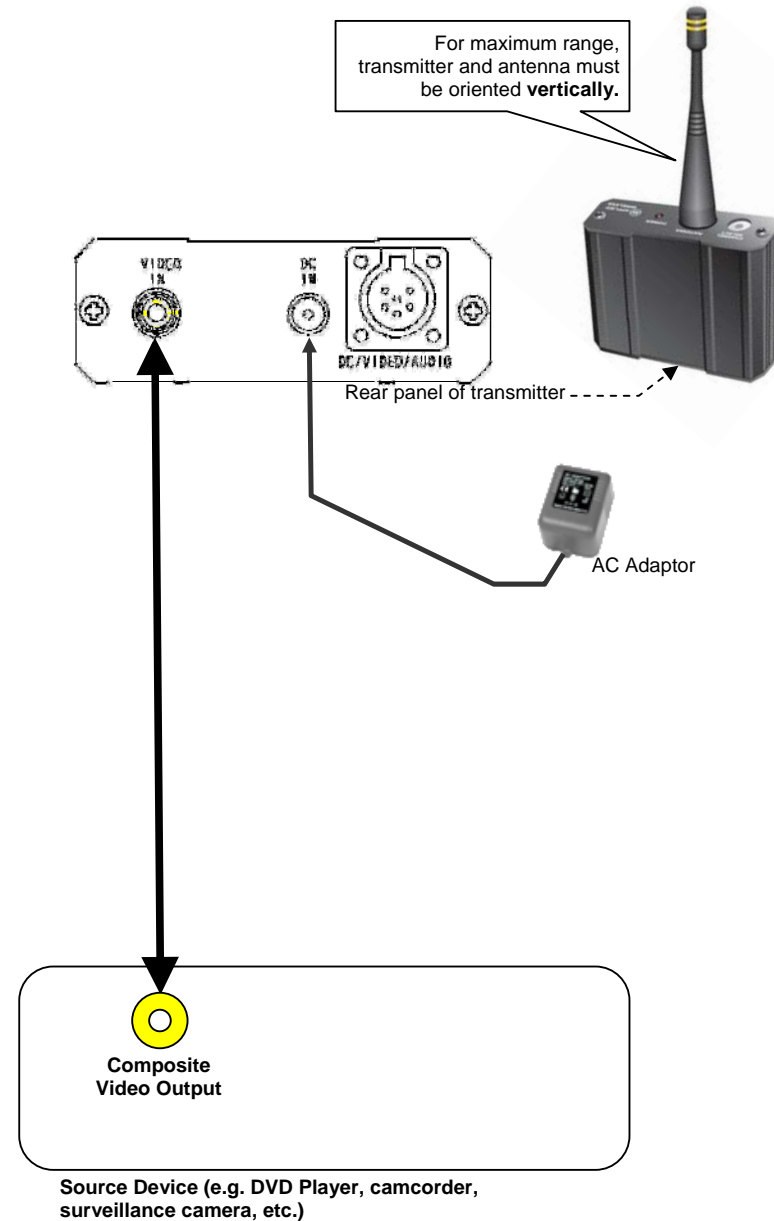
Table 1 - Combination Connector Pinout

Pin	Circuit
1	DC Power In (+7.5 to +18 volts)
2	DC Ground
6	Video (+)
3	Video Ground
5	Not used
4	Not used

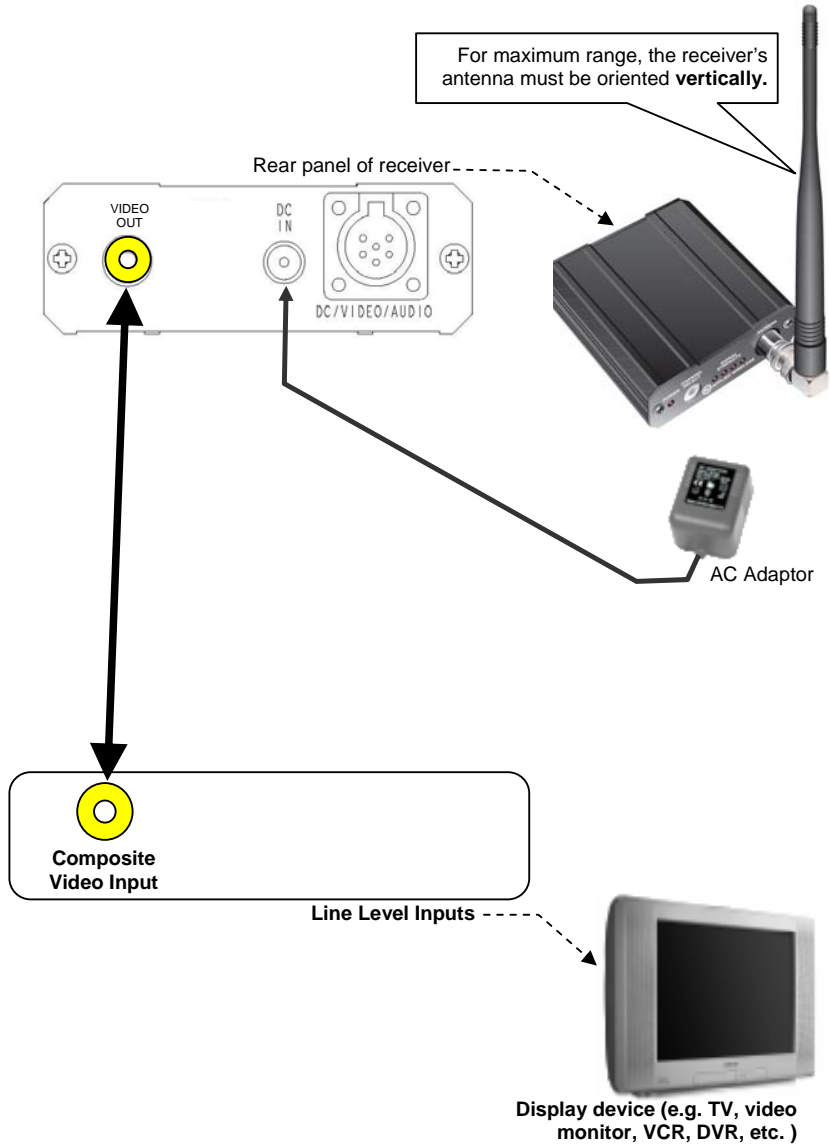
Signal Strength Indicator (VR900-3 Receiver)

The VR900-3 receiver will display the relative strength of the received RF signal, by illuminating some or all of the four red Signal Strength LEDs on the front panel. The Signal Strength indicator(s) will also illuminate if local in-band interference is present. If the Signal Strength LEDs are indicating that a strong signal is being received, and yet the video and/or audio quality is poor, turn off the transmitter (by unplugging its power connector). If the receiver's Signal Strength LEDs continue to indicate reception of a strong signal, changing the channel of operation (on both the transmitter and receiver) may improve the results.

Transmitter Connection Diagram



Receiver Connection Diagram



Transmitter Specifications VT900-3A

Operating Frequency	
Channel 1	907 MHz
Channel 2	915 MHz
Channel 3	923 MHz
Video Frequency Response*	0.5 – 4.0 MHz
RF Output Power (VT900-3A)	1 mW (0 dBm)
Operating Voltage	7.5 to 18VDC
Operating Current (VT900-3A)	65 mA
FM Deviation (@ 1V P-P input)	+/- 3 MHz
Differential Gain Error	3% p-p (max)
Differential Phase Error	3% p-p (max)
Harmonic Suppression	-45 dBc
Antenna Output Impedance	50 Ohms
Operating Temperature Range	-20°C to +70°C
Storage Temperature Range	-50°C to +150°C

*Video performance specifications are "end-to-end" characteristics, when used with Model VR900-3 receiver.

Receiver Specifications (VR900-3)

Operating Frequency	
Channel 1	907 MHz
Channel 2	915 MHz
Channel 3	923 MHz
Video Frequency Response (-3 dB)*	0.5 – 4.0 MHz
RF Input Sensitivity (30 dB SNR)	-85 dBm
Operating Voltage	7.5 to 18VDC
Operating Current	160 mA
Differential Gain Error	5% p-p (max)
Differential Phase Error	5% p-p (max)
Video Output, +/- 3MHz Deviation	1.0 Vp-p
Video Output Impedance	75 Ohms
IF Frequency	75 MHz
IF Bandwidth	12 MHz
Harmonic Suppression	-45 dBc
Antenna Impedance	50 Ohms
Image Rejection	80 dB
Operating Temperature Range	-20°C to +70°C
<i>Storage Temperature Range</i>	<i>-50°C to +150°C</i>

*Video performance specifications are "end-to-end" characteristics, when used with Model VT900-3 transmitter.

INSTRUCTION TO THE USER (required by the FCC)

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment has been certified to comply with the limits for a class B computing device, pursuant to FCC Rules. In order to maintain compliance with FCC regulations, shielded cables must be used with this equipment. Operation with non-approved equipment or unshielded cables is likely to result in interference to radio and TV reception. The user is cautioned that changes and modifications made to the equipment without the approval of manufacturer could void the user's authority to operate this equipment.

ONE YEAR LIMITED WARRANTY (USA)

Products manufactured by APPLIED WIRELESS, INC. (AW) and sold to purchasers in the USA are warranted by AW according to the following terms and conditions. You should read this Warranty thoroughly.

● WHAT IS COVERED, AND DURATION OF COVERAGE:

AW warrants the product to be free from defects in materials and workmanship for one (1) year from the date of purchase by the original end user purchaser.

● WHAT IS NOT COVERED:

This warranty does not apply to the following:

1. Damage caused by accident, physical or electrical misuse or abuse, improper installation, failure to follow instructions contained in the User's Guide, any use contrary to the product's intended function, unauthorized service or alteration (i.e. service or alteration by anyone other than AW).
2. Damage occurring during shipment.
3. Damage caused by acts of God, including without limitation: earthquake, fire, flood, storms, or other acts of nature.
4. Damage or malfunction caused by the intrusion of moisture or other contamination within the product.
5. Batteries supplied by AW in or for the product.
6. Cosmetic deterioration of chassis, cases, or pushbuttons resulting from wear and tear typical of normal use.
7. Any cost or expense related to troubleshooting to determine whether a malfunction is due to a defect in the product itself, in the installation, or any combination thereof.
8. Any cost or expense related to repairing or correcting the installation of an AW product.
9. Any cost or expense related to the removal or reinstallation of the product.
10. Any product whose serial number or date code is altered, defaced, obliterated, destroyed, or removed.

This warranty is extended to the original purchaser of the product(s) only, and is not transferable to any subsequent owner or owners of the product(s). AW reserves the right to make changes or improvements in its products without incurring any obligation to similarly alter products previously purchased.

● EXCLUSION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES:

AW expressly disclaims liability for incidental and consequential damages caused (or allegedly caused) by the product. The term "incidental or consequential damages" refers (but is not limited) to:

1. Expenses of transporting the product to AW to obtain service.
2. Loss of use of the product.
3. Loss of the original purchaser's time.

● LIMITATION OF IMPLIED WARRANTIES:

This warranty limits AW's liability to the repair or replacement of the product. AW makes no express warranty of merchantability or fitness for use. Any implied warranties, including fitness for use and merchantability, are limited in duration to the period of the one (1) year express limited warranty set forth herein. The remedies provided under this warranty are exclusive and in lieu of all others. AW neither assumes nor authorizes any person or organization to make any warranties or assume any liability in connection with the sale, installation, or use of this product.

Some states do not allow limitations on how long an implied warranty lasts, and some states do not allow the exclusion or limitation of liability for incidental or consequential damages so the limitations or exclusions stated herein may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

(continued on next page)

ONE YEAR LIMITED WARRANTY (USA), cont.

● HOW TO OBTAIN WARRANTY SERVICE:

If a product covered by this warranty and sold in the USA by AW proves to be defective during the warranty period AW will, at its sole option, repair it or replace it with a comparable new or reconditioned product without charge for parts and labor, when said product is returned in compliance with the following requirements:

1. You must first contact AW at the following address/phone for assistance:

APPLIED WIRELESS, INC.
1250 Avenida Acaso, Suite F
Camarillo, CA 93012
Phone: (805) 383-9600

If you are instructed to return your product directly to the factory, a Return Merchandise Authorization number (RMA) will be issued to you.

2. You must package the product carefully and ship it insured and prepaid. The RMA number must be clearly indicated on the outside of the shipping container. *Any product returned without an RMA number will be refused delivery.*
3. In order for AW to perform service under warranty, you must include the following:
 - (a) Your name, return shipping address (not a PO Box), and daytime telephone number.
 - (b) Proof of purchase showing the date of purchase.
 - (c) A detailed description of the defect or problem.

Upon completion of service, AW will ship the product to the specified return shipping address. The method of shipping shall be at AW's sole discretion. The cost of return shipping (within USA) shall be borne by AW.

Troubleshooting Guide

Symptom	Possible Problem	Notes
Poor Range	Antenna	Whip (or other omni-directional) antennas-Receiver Antenna connected, vertically oriented and placed preferably at least 7' high? Flat Panel or Yagi antennas (directional antennas)- Receiver Antenna connected, properly directed towards transmitter, and placed preferably at least 7' high?
Shifting colors	Multipath Interference	Locate antennas higher to avoid multipath from people or vehicle movement
	Location Null	Move position of receive or transmit antennas a few inches
Doesn't Work	Power	Check power to equipment (power LED lights?). If snow can be seen on monitor, then receiver is working.
	RF Interference	Check Signal Level LEDs for activity with Transmitter powered off. If activity is present: Try a different channel Check equipment operation at a different location
	Channel Match	Transmitter and receiver on same channel?
	Connections	Composite video "line in" connected to transmitter, composite video "line out" connected from receiver to monitor?
	Monitor/TV Setting	Monitor mode set for viewing "line in" signal?



Applied Wireless products are designed and manufactured with pride in the United States of America

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